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# Pain beliefs of hemodialysis patients and non-pharmacological methods they use to relieve pain



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**Abstract**
Aim: This study was carried out to determine hemodialysis patients' pain beliefs and nonpharmacological methods used by patients for pain.
Material and Methods: The research was carried out between July-September 2020. The study was conducted with 103 patients who volunteered to participate in the study, who did not have communication and psychological problems, and who had been on hemodialysis treatment for at least 6 months. The data were collected using patient information form, non-pharmacological methods form used by patients for pain, and a Pain Beliefs Scale. The descriptive statistical methods, Student's t-test, the One-way Anova and Tukey's Post Hoc were used in the statistical analysis of the study data.
Results: It was determined that 49.5% used pharmacological methods to relieve pain, 39.8% used non-pharmacological methods to relieve pain. Among the non-pharmacological methods used in pain relief, the most used methods are massage (24.2%) and cold application (14.5%), respectively. It was found that patients' pain beliefs scale the psychological score average was higher than organic score average.
Discussion: In the study, the nonpharmacological methods that patients use most for pain relief were massage and cold application. It was determined that the patients attribute pain to psychological reasons rather than organic ones. To reduce pain in hemodialysis patients, it is important to apply analgesic treatment according to the doctor's request, to use nonpharmacological methods used in pain relief by providing interdisciplinary communication and to evaluate the results.

**Keywords**
Hemodialysis, Nursing, Non-Pharmacological Methods, Pain Beliefs, Pain

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## Introduction

End-stage renal disease (ESRD) is a health problem with a very high morbidity and mortality rate both in Turkey and in other countries of the world [1]. ESRD is not only a progressive and chronic loss of kidney functions, but also a life-threatening process [1]. In this process, renal replacement therapies such as organ transplantation and dialysis are applied to ensure the continuity of life [2]. The aim of hemodialysis (HD) treatment is to increase the quality of life of individuals, to enable them to maintain their roles and responsibilities, and to increase their self-care abilities [3].

Patients with ESRD are faced with many HD treatment-induced complications [4]. The vast majority of patients have difficulties in coping with these complications. Of these problems, the leading one is pain, a symptom that impairs the quality of life in the hemodialysis patient group [5,6]. Chronic pain experienced by HD patients, which is difficult to manage with traditional treatment methods, arises as a result of vascular disorders, diabetes, changes in the musculoskeletal system, and accumulation of metabolic wastes in the body [1]. As reported in several studies, 50% of HD patients experience pain, and more than 50% of these patients describe their pain as moderate or severe [6]. In another study, it was emphasized that pain felt by HD patients increases their depression and worsens their sleep quality and quality of life [7].

Although pain develops due to tissue damage and has an organic basis, psychosocial factors are also involved in its etiology. The patient's genetic structure, emotional and cultural characteristics, beliefs and personal characteristics affect the frequency and severity of the pain he or she experiences and his or her strength to cope with pain [8]. In studies, it is reported that the beliefs of individuals who experience pain about whether the origin of the pain is organic or psychological may create differences in their coping strategies [9]. Therefore, determining patients' pain beliefs and evaluating the coping methods chosen according to the pain belief play an important role in managing pain effectively.

Pharmacological pain management is complex in patients with ESRD, due to factors such as toxic effects of medication and difficulty in coping with pain. Accordingly, patients often prefer non-pharmacological methods in addition to pharmacological agents in coping with pain due to the highly toxic effects of pharmacological agents and the patients' unwillingness to use too many drugs [10]. As reported in the literature, among the complementary methods frequently used by patients with renal failure, there are non-pharmacological methods such as consumption of herbal products, relaxation, hypnosis, acupuncture, acupressure, yoga, massage, music, reflexology and aromatherapy [11,12]. It has also been reported that the rate of using herbal supplements by patients with chronic renal failure (CRF) ranges from 16.8% to 45% (patients with chronic renal failure (CRF) use herbal supplements at rates ranging from 16.8% to 45%) [13]. In another study, methods frequently used by HD patients to cope with pain were determined as massage and hot-cold application [14]. The number of patients undergoing HD due to CRF is increasing, and the pain symptom they suffer affects their daily life and quality of life adversely. In this case, since knowing the pain characteristics and beliefs of hemodialysis patients can affect their knowledge, skills, and pharmacological and non-pharmacological methods they use in pain management, determining these characteristics and encouraging them to cooperate with health professionals are of great importance. Therefore, the present study was conducted to determine the pain beliefs of hemodialysis patients and the non-pharmacological methods they use to overcome their pain.

## Material and Methods

### *The design of the study*

This descriptive, correlative, and cross-sectional study population consisted of patients who received hemodialysis treatment in the Dialysis Unit of a hospital between July-September 2020.

### *Population and sample*

Of the patients in the study population, 103 who over the age of 18, who received hemodialysis treatment, which started at least six months ago while the study was conducted, who had no communication or psychiatric problems, and volunteered to participate in the study, comprised the sample of the study.

### *Data collection tools*

The study data were collected using the Patient Information Form, and the Pain Beliefs Questionnaire (PBQ).

The Patient Information Form developed through a literature review consists of items questioning the sociodemographic characteristics, disease and treatment-related characteristics form to assess the Pain Experience and Non-Pharmacological Methods.

PBQ developed by Edwards et al. [15] consists of 2 sub-dimensions (Psychological Beliefs and Organic Beliefs) and 12 items. The Turkish validity and reliability study of the PBQ was conducted by Berk in 2006 [16]. The Cronbach's Alpha internal consistency coefficient of the scale in Berk et al.'s study was 0.71 for the Organic Beliefs sub-dimension and 0.73 for the Psychological Beliefs sub-dimension [16]. In the present study, the Cronbach's Alpha internal consistency coefficient was 0.82 for the Organic Beliefs sub-dimension and 0.77 for the Psychological Beliefs sub-dimension.

### *Evaluation of data*

The SPSS (Statistical Package for the Social Sciences) 24.0 package program was used to analyze the data obtained. The result of the Shapiro–Wilk normality test indicated that the data were normally distributed. ($p>0.05$). The descriptive statistical methods, Student's t-test, the One-way ANOVA, and Tukey's Post Hoc were used in the statistical analysis of the study data. P-values less than 0.05 were considered statistically significant.

### *Ethical considerations*

Before the study was conducted, ethical approval to conduct the study was obtained from the Clinical Research Ethics Committee of a university (Approval number: 06/29, Date of approval: June 22, 2020). The patients participating in the study were informed about the study and their written consent indicating that they volunteered to participate in the study was obtained. They were told that the personal information they provided would not be disclosed to anyone by the researcher in accordance with the confidentiality principle.

## Results

The mean age of the patients participating in the study was 56.93±13.81 years, and the mean duration of hemodialysis treatment they underwent was 6.58±5.76 years. Of the participants, 61.2% were men, 76.7 % married, 63.1% were primary school graduates, 55.3% had a middle economic level, 10.7% were smokers, 44.7% took their medications sometimes, 92.2% underwent hemodialysis treatment 3 times a week, and 76.7% had a comorbid chronic disease, 67% experienced pain sometimes, 73.8% experienced pain after hemodialysis, and 57.3% experienced musculoskeletal pain. While 49.5% of the participating patients preferred the pharmacological method to overcome pain, 39.8% preferred the non-pharmacological method. Of those who preferred the most used non-pharmacological method, massage (24.2%) and cold application (14.5%) (Table 1).

It was found the Psychological Beliefs sub-dimension score average of the BPQ was higher than the organic score average (Table 2).

The mean score of illiterate participants who took medication regularly, experienced pain continually, experienced pain during and after the dialysis, experienced musculoskeletal pain and headache obtained from the Organic Beliefs sub-dimension was higher than in other participants ($p<0.05$). The participants who used a non-pharmacological method for pain obtained higher mean scores from the Psychological Beliefs sub-dimension than did the participants who did not use a non-pharmacological method ($p<0.05$) (Table 3).

## Discussion

Pain has been reported as one of the most common symptoms experienced by patients undergoing hemodialysis [5,6]. The pain experienced by hemodialysis patients adversely affects the coping process, their functional capacity, sleep quality and therefore quality of life [7]. Since pain is also affected by psychosocial factors, patients' beliefs, expectations, attitudes to cope with pain, and social support have an impact on their pain management [8].

In the present study, 88.4% of the patients experienced pain, and 67% of the patients who experienced pain experienced it sometimes. In a study conducted with hemodialysis patients, the prevalence of pain was 81% [17]. In another study, the prevalence of pain was determined as 8.2% [18]. In Fleishman et al. (2018)' s study conducted with hemodialysis patients, 82% of the patients experienced pain.

In the present study, 73.8% of the patients experienced pain after hemodialysis. Dikmen and Aslan (2020) reported that 74.2% of patients experienced pain after hemodialysis sessions.

In the present study, 57.3% of the participants experienced musculoskeletal pain. In the literature, it has been reported that 60-65% of hemodialysis patients have pain originating from the musculoskeletal system [5,6].

Hemodialysis patients often prefer non-pharmacological methods in addition to pharmacological agents in coping with pain because pharmacological agents have high toxic effects and patients do not want to take too many drugs [10]. While 49.5% of the participants preferred the pharmacological

**Table 1.** Sociodemographic variables, characteristics related to pain experience and non-pharmacological methods of the participants (n=103)

| Variables | | Mean±SD | | | | Mean±SD | |
|---|---|---|---|---|---|---|---|
| Mean age (years) | | 56.93±13.81 | | Mean duration of undergoing hemodialysis (years) | | 6.58±5.76 | |
| | | n | % | | | n | % |
| Sex | Woman | 40 | 38.8 | When is the pain felt mostly? | After dialysis | 76 | 73.8 |
| | | | | | During dialysis | 7 | 6.8 |
| | Men | 63 | 61.2 | | On non-dialysis days | 8 | 7.8 |
| | | | | | No pain | 12 | 11.6 |
| Marital status | Married | 79 | 76.7 | Using a pharmacological method for pain | Yes/No | 51/52 | 49.5/51.5 |
| | Single | 24 | 23.3 | | | | |
| Educational Status | Illiterate | 16 | 15.5 | Using a non-pharmacological method for pain | Yes/No | 41/62 | 39.8/60.2 |
| | Literate but not a graduate of any school | 5 | 4.9 | Drinking chamomile tea | Yes/No | 7.96 | 6.8/93.2 |
| | Primary education | 65 | 63.1 | | | | |
| | High school | 9 | 8.7 | Diverting attention | Yes/No | 6.97 | 5.8/94.2 |
| | Higher education | 8 | 7.8 | | | | |
| Income level | Sufficient | 22 | 21.4 | Hot-cold application | Yes/No | 15/88 | 14.5/85.5 |
| | Middle | 57 | 55.3 | | | | |
| | Insufficient | 24 | 23.3 | Massage | Yes/No | 25/78 | 24.2/75.8 |
| Smoking Status | Yes/No | 11/92 | 10.7/89.3 | Drinking lemon juice | Yes/No | 7.96 | 6.8/93.2 |
| Taking medication regularly | Always | 25 | 24.3 | Type of pain | Musculoskeletal pain | 59 | 57.3 |
| | Sometimes | 46 | 44.7 | | Headache | 29 | 28.2 |
| | Never | 32 | 31.1 | | Stomachache | 3 | 2.9 |
| The number of dialyses undergone per week | Twice | 8 | 7.8 | | No pain | 12 | 11.6 |
| | Three times | 95 | 92.2 | Frequency of pain experience | Continually | 22 | 21.4 |
| Presence of a comorbid chronic disease | Yes/No | 79/24 | 76.7/23.3 | | Sometimes | 69 | 67.0 |
| | | | | | Never | 12 | 11.6 |

**Table 2.** Distribution of mean scores obtained from the organic and psychological beliefs sub-dimensions of the Pain Beliefs Questionnaire (n=103)

| | Mean | SD | Minimum | Maximum |
|---|---|---|---|---|
| Organic Beliefs | 3.35 | 1.01 | 1 | 1 |
| Psychological Beliefs | 4.62 | 1.14 | 6 | 6 |

**Table 3.** Relationship between the participants' sociodemographic, pain experience and non-pharmacological method characteristics and the mean scores they obtained from Beliefs Sub-Dimensions of the PBQ

| Variables | | Organic Beliefs | Psychological Beliefs |
|---|---|---|---|
| | | (3.35±1.01) | (4.62±1.14) |
| Sex | Women | 3.51±1.01 | 4.75±0.77 |
| | Men | 3.25±1.01 | 4.54±1.32 |
| t/p | | t=1.247 p=0.215 | t=1.008 p=0.316 |
| Educational status | Illiterate (1) | 3.65±1.68 | 4.10±1.62 |
| | Literate but not a graduate of any school (2) | 2.37±0.34 | 4.70±0.95 |
| | Primary education (3) | 3.52±0.76 | 4.76±0.99 |
| | High school (4) | 2.70±1.08 | 4.50±1.39 |
| | Higher education (5) | 2.78±0.33 | 4.62±0.86 |
| F/p | | F=3.901 p=0.006 | F=1.111 p=0.356 |
| Difference | | 1>3>4>5>2 | - |
| t/p | | t=1.499 p=0.137 | t=0.709 p=0.477 |
| Taking medication regularly | Always (1) | 2.98±0.76 | 4.97±0.69 |
| | Sometimes (2) | 3.29±0.73 | 4.64±1.12 |
| | Never (3) | 3.74±1.37 | 4.34±1.38 |
| F/p | | F=4.421 p=0.014 | F=2.162 p=0.120 |
| Difference | | 3>2>1 | - |
| Frequency of pain experience | Continually (3) | 4,13±1.12 | 4.93±0.90 |
| | Sometimes (2) | 3.25±0.87 | 4.51±1.18 |
| | Never (1) | 2.56±0.67 | 4.75±1.27 |
| F/p | | F=12.974 p=0.000 | F=1.214 p=0.301 |
| Difference | | 3>2>1 | - |
| When is the pain felt mostly? | After dialysis (1) | 3.48±1.05 | 4.63±1.17 |
| | During dialysis (2) | 3.71±0.15 | 5.46±0.26 |
| | On non-dialysis days (3) | 3.03±0.94 | 3.87±0.56 |
| | No pain (4) | 2.55±0.65 | 4.62±1.25 |
| F/p | | F=3.777 p=0.013 | F=2.517 p=0.063 |
| Difference | | 4<1,2 | - |
| Type of pain | Musculoskeletal pain (1) | 3.51±1.11 | 4.69±1.08 |
| | Headache (2) | 3.34±0.78 | 4.47±1.29 |
| | Stomachache (3) | 3.75±0.43 | 5.00±0.43 |
| | No pain (4) | 2.52±0.63 | 4.56±1.25 |
| F/p | | F=3.574 p=0.017 | F=0.354 p=0.786 |
| Difference | | 4<1,2 | - |
| Using a non-pharmacological method for pain | Yes | 3.52±1.08 | 4.98±0.82 |
| | No | 3.25±0.96 | 4.39±1.26 |
| t/p | | t=1.346 p=0.181 | t=2.852 p=0.005 |

*p<0.05, t: Student t-test, F: One-Way Anova Test, **Tukey's Post Hoc Test.

method, 39.8% preferred the non-pharmacological method. Among the nonpharmacological methods used in pain relief, the most used methods are massage (24.2%) and cold application (14.5%), respectively. In a study, CRF patients were reported to use herbal supplements to cope with pain at rates ranging from 16.8% to 45% [13]. In another study, HD patients frequently used such methods as massage and hot-cold application to cope with pain [14]. In a study conducted with patients with CRF in our country, Turkey, 25.2% of the patients used one of the non-pharmacological methods. Of them, 50.6% used mind-body techniques, 32.6% used massage therapy, and 16.8% used herbal products. The most preferred herbal products were garlic and linden tea [11].

In the present study, 39.8% of the participants preferred the non-pharmacological method. In the literature, it is stated that patients with CRF prefer non-pharmacological methods because they feel physically and emotionally good, they want to prevent health problems, and they think that it is safer than traditional treatments [11,21]. In addition, it is emphasized that if patients use a non-pharmacological method, they often do not share the method they use with the healthcare team [12]. Although pain develops due to tissue damage and has an organic basis, psychosocial factors are also involved in its etiology [8]. Therefore, evaluation of pain from both organic and psychosocial aspects is of great importance [9,22].

In the present study, the Psychological Beliefs sub-dimension score average of the BPQ was higher than the Organic Beliefs sub-dimension score average. Hemodialysis patients believe that psychological factors are the cause of pain. In Ozer et al. (2020)' s study hemodialysis patients attribute the cause of their pain to psychological factors rather than organic factors. Pain is an unpleasant sensory and emotional experience associated with a person's experiences [5]. The fact that the treatment of patients with renal failure, which is a chronic disease, lasts life-long, leads to the loss of workforce and dependence of these patients on family members, brings physiological, economic and mental problems related to the disease [23]. In the light of this information, the fact that patients who undergo HD treatment believe that psychological reasons are the cause of their pain, is an expected result.

The mean score of the illiterate participants obtained from the Organic Beliefs sub-dimension was higher than that of the other participants. Cornally and McCarthy (2011) stated that organic beliefs were associated with health-seeking behavior and help demand, which is thought to pave the way for illiterate individuals receiving hemodialysis treatment to display health-seeking behavior more and to demand help more than individuals with a high education level, and therefore to believe in the organic dimension of pain.

The mean score of the participants who never took their medication regularly, obtained from the Organic Beliefs sub-dimension, was higher than that of participants who always or sometimes took their medication regularly. The need to benefit from an invasive treatment such as HD to survive, and experiencing pain negatively affect patients' compliance with treatment [25]. Therefore, it is thought that patients with increased non-adherence to treatment due to lack of self-management strength believe in the organic beliefs dimension,

which indicates that pain is stable and unchanging.

The mean score of the participants who experienced continuous pain, obtained from the Organic Beliefs sub-dimension, was higher than that of the participants who sometimes experienced pain or did not experience pain at all. The mean score of the participants who suffered from musculoskeletal pain obtained from the Organic Beliefs sub-dimension was higher than that obtained by the participants who did not experience pain. The type and the severity of the pain experienced by the patients affected the pain beliefs of the patients, which should be taken into account during the comprehensive assessment of pain. In their study, Baird and Haslam (2013) determined that of the participants, those who experienced pain frequently and especially those who experienced musculoskeletal pain had high levels of organic pain beliefs. This suggests that the continuous experience of pain and the type of pain lead to the belief that the pain is of organic origin, such as a damage or injury to the body.

The mean score of the participants who experienced pain during and after dialysis, obtained from the Organic Beliefs sub-dimension was higher than was that obtained by the participants who did not experience pain. In a study, it was stated that patients experienced pain during and after dialysis, and the patients defined the severity of pain as moderate or severe [20]. It is thought that due to the intensity of pain experienced by the patients during and after dialysis, their belief in the organic dimension of pain is stronger.

Participants who used non-pharmacological methods to cope with pain obtained a higher mean score from the Psychological Beliefs sub-dimension than those who did not use non-pharmacological methods. In the literature, it is stated that psychological factors such as anxiety and depression affect psychological beliefs of pain, and that techniques such as distraction and relaxation should be used in pain management [9]. Accordingly, the fact that individuals who receive HD treatment and use non-pharmacological methods in the treatment of pain believe that pain is of psychological origin is an expected result.

Conclusion

In the present study, the most commonly used non-pharmacological treatment methods to relieve pain were massage and hot-cold application, and the patients attributed the cause of pain to psychological causes rather than organic ones. As is known, nephrology nurses are expected to diagnose and manage symptoms, to plan care, and to comprehensively evaluate the needs of caregivers of individuals with end-stage renal disease. In a nursing intervention performed to reduce pain in hemodialysis patients, evaluation of the location, severity, characteristic and degree of pain, questioning of the factors that reduce/increase pain, determination of pain beliefs, determination of the non-pharmacological treatment method preferred by the patients to cope with pain, application of analgesic treatment upon the doctor's request, the use of the non-pharmacological method preferred by the patient in pain relief by providing interdisciplinary communication and evaluation of the results are of great importance. Within this context, nurses should inform their patients about the possible risks, benefits and limitations of the methods used, be able to answer their questions, establish clear communication and monitor patients for the effects of these methods.

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***Scientific Responsibility Statement***

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.*

***Animal and human rights statement***

*All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.*

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